



# **ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY GUWAHATI**

**Course Structure and Syllabus  
(From Academic Session 2018-19 onwards)**

**B.TECH  
CIVIL ENGINEERING  
7<sup>TH</sup> SEMESTER**



# ASSAM SCIENCE AND TECHNOLOGY UNIVERSITY

Guwahati

Course Structure

(From Academic Session 2018-19 onwards)

**B.Tech 7<sup>th</sup> Semester: Civil Engineering**  
Semester VII/ B.TECH/CE

Sl. No.	Sub-Code	Subject	Hours per Week			Credit	Marks	
			L	T	P		C	CE
<b>Theory</b>								
1	CE181701	Quantity Surveying	3	0	0	3	30	70
2	CE1817PE1*	Program Elective-1	3	0	0	3	30	70
3	CE1817PE2*	Program Elective-2	3	0	0	3	30	70
4	CE1817OE1*	Open Elective-1	3	0	0	3	30	70
5	HS181704	Principles of Management	3	0	0	3	30	70
<b>Practical</b>								
1	CE181722	Project-1	0	0	6	3	50	50
2	SI181721	Internship-III (SAI-Industry)	0	0	0	2	-	200
<b>TOTAL</b>			<b>15</b>	<b>0</b>	<b>6</b>	<b>20</b>	<b>200</b>	<b>600</b>
<b>Total Contact Hours per week : 21</b>								
<b>Total Credit: 20</b>								

<b>Programme Elective – 1</b>		
Sl.No.	Subject Code	Subject
1	CE1817PE11	Advanced Structural Analysis
2	CE1817PE12	Water Resources Engineering
3	CE1817PE13	Ground Improvement Technique
4	CE1817PE1*	Any other subject offered from time to time with the approval of the University

<b>Programme Elective – 2</b>		
Sl.No.	Subject Code	Subject
1	CE1817PE21	Earthquake Engineering
2	CE1817PE22	River Engineering
3	CE1817PE23	Machine Foundation
4	CE1817PE2*	Any other subject offered from time to time with the approval of the University

<b>Open Elective – 1</b>		
Sl.No.	Subject Code	Subject
1	CE1817OE11	Optimization Techniques
2	CE1817OE12	Environmental Impact Assessment

## Detail Syllabus:

Course Code	Course Title	Hours per week L-T-P	Credit C
CE181701	Quantity Surveying	3-0-0	3

### MODULE 1: Introduction

Principle of estimating, Purpose and type of estimating, Main items of work and their units of measurement, Standard methods of measurements.

### MODULE 2: Specifications of Work

Aims of specification, Types, Method of preparation, General specification of different classes of buildings, Detail specification of some important items.

### MODULE 3: Rate Analysis & Schedule of Rates

Purpose, Factors affecting Rate Analysis, Labour & Material requirement for important items of work, Analysis of rates for various Items of buildings.

Local schedule of Rates, Rates of important items of work from different Government schedule of rates.

### MODULE 4: Building Estimate

Estimate of Single Storied Building (sloped roof, Trusses, R.C.C., P.C.C., openings, flooring, finishing), Preparation of B.O.Q.

Estimate of septic tank: septic tank, water supply and sanitary installation.

### MODULE 5: Road Estimate

Estimate of earthwork, Estimate of pitching of slopes, Estimate for a New Road, Culvert.

### MODULE 6: Valuation- Introduction & Methods

Cost, Price & Value, Different forms of value, Purpose of valuation, Different methods of valuation. Rental method of valuation - Different forms of Rent, Sinking Fund, Year's Purchase, Annuity. Method of depreciation - Various methods of Depreciation, numerical problems.

### MODULE 7: Land & Building Method

Various methods of valuation of buildings, belting method of land valuation, Numerical problems of valuation of land and building.

### Textbooks/Reference Books:

1. "Estimating and Costing in Civil Engineering" by Prof. B. N. Dutta, UBS Publishers Distributors Pvt. Ltd.
2. "Estimating, Costing and Specification in Civil Engineering" by Mr. M. Chakraborty.
3. "A Textbook of Estimating and Costing (Civil)" by D. D. Kohli and R. C. Kohli S. Chand & Company Ltd.
4. "Estimation Costing and Valuation" by Rangwala, Charotar Publishing House Pvt. Ltd.
5. "Estimating and Costing" by G.S. Birdie, Dhanpat Rai Publishing Company Pvt. Ltd.

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817PE11	Advanced Structural Analysis	3-0-0	3

### **MODULE 1: Analysis of Indeterminate Structures**

**Review of basic concepts in structural analysis:** structural elements, joints and supports, stability, rigidity and static indeterminacy, kinematic indeterminacy; applications of principle of virtual work and displacement- based and force- based energy principles; deriving stiffness and flexibility coefficients

**Indeterminate structures:** Brief review of Slope-deflection method, Moment distribution method

### **MODULE 2: Introduction to Matrix Analysis of Structures**

Matrix; vector; basic matrix operations; rank; Review of solution of linear simultaneous equations; Eigen values and Eigen vectors.

Introduction to Local and Global/ Structure coordinate systems; displacement and force transformation matrices; Element and Structure stiffness matrices; equivalent joint loads; stiffness and flexibility approaches

### **MODULE 3: The Direct Stiffness Method**

Introduction to computer application; Numerical modeling of structure for analysis; Nodal Data, Member / Element data; Member property data; Material data for structure;

Defining structure in Global coordinate system; Formation of Member stiffness matrices in Local coordinate; Assembly of Structure stiffness matrix in Global coordinate; Understanding application of Boundary conditions; Formulation of Load vectors; Matrix solution for Global displacements

### **MODULE 4: Direct Stiffness Method for Analysis of Plane Truss, Plane Frame**

Structural Analysis of Plane truss by Direct stiffness method (four DOF per element)

Structural Analysis of Plane frames by Direct stiffness method (six DOF per element)

### **MODULE 5: Unsymmetrical Bending and Shear Centre**

Principal moment of inertia, Stress in beams due to unsymmetrical bending, Shear Centre, Methods of Locating Shear Centre

#### **Textbooks/ Reference Books:**

1. Matrix method of Structural Analysis- S SBhavikatti, VIKASH PUBLISHING HOUSE PVT LTD
2. Advanced Structural Analysis- Devdas Menon, Narosa Publishing House, 2009.
3. Matrix Methods of Structural Analysis- P. N. Godbole R.S. Sonparote, S.U. Dhote, Publisher: PHI
4. Matrix Analysis Framed Structures - Weaver, William, Gere, James M. Publisher: CBS
5. Structural Analysis: T S Thandavamoorthy, Oxford University Press.
6. Basic Structural Analysis- C S Reddy, McGraw Hill Education (India) Private Ltd., New Delhi.
7. Structural Analysis-II- S SBhavikatti, Vikash Publishing House Pvt Ltd

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817PE12	Water Resources Engineering	3-0-0	3

### **MODULE 1: Introduction**

Fields of water resources engineering; problems of water resources engineering, economics in water resources engineering, Social aspects of water resources engineering, planning of water resources projects, the future of water resources engineering. Water resource in North East and its use

### **MODULE 2: Engineering Economy in Water Resources Planning**

Social importance, steps in an Engineering economy study, discount rate, sunk cost, intangible values, economic life, physical life and period of analysis of a project, cash flow diagram, discounting factors – single payment factors and uniform annual series factors, discounting methods, present worth method, rate of return method, annual cost method, benefit cost ratio method

### **MODULE 3: Cost Allocation**

Definition, separable cost, joint cost, common cost, method of cost allocation–remaining benefits method and alternative justifiable expenditure method

### **MODULE 4: Planning for Water Resources Development**

Levels of planning, phases of planning objectives, data required for planning, projections for planning, project formulation, project evaluation, environmental considerations in planning multipurpose project planning, requirement of uses in multipurpose projects, drawbacks in project planning

### **MODULE 5: Reservoir**

Purpose, physical characteristics of reservoir, storage capacity determination from the site, reservoir site selection, reservoir capacity determination, reservoir sedimentation, trap efficiency, distribution of sediment in a reservoir, useful life of reservoir, reservoir operation and operation rule curves, reservoir yield, economic height of a dam, reservoir working table

### **MODULE 6: River Bank Erosion**

Causes, anti-erosion measures, design of anti-erosion structures

### **Textbooks/ Reference Books:**

1. Water Resources Engineering-by R.K. Linsley& J.B. Franzini, McGraw-Hill International Book Company
2. Water Power Engineering- by M.M. Dandekar & K.N. Sharma, Vikash Publishing House Pvt. Ltd., Noida, UP
3. Irrigation and Water Resources Engineering –by G.L. Asawa, New Age International (P) Limited Publishers
4. Hydrology and Water Resources Engineering –by S.K. Garg, Khanna Publishers, Delhi
5. Economics of Water Resources Planning –by L. Douglas James and Robert R. Lee, McGraw-Hill Book Company
6. Irrigation and Water Resources Engineering –by B.C. Punmia, Pande& B.B. Lal, Standard Publishers Distributors, Delhi
7. IS 8408:1994 Planning and Design of Groynes in alluvial river Guidelines.
8. IS 10751:1994 Planning & Design of Guide Banks for alluvial rivers Guidelines
9. River Behaviour Management and Training (Vol. I& II), Central Board of Irrigation and Power, 1994

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817PE13	Ground Improvement Technique	3-0-0	3

#### **MODULE 1: Surface Compaction**

Introduction, Review of compaction theory, Field procedures of compaction, Equipment for Surface Compaction, Quality Control

#### **MODULE 2: In-situ Deep Compaction in Granular Soils**

Introduction, In-situ densification methods in granular soils, Terra-Probe, Vibroflotation techniques, Ground Suitability for Vibroflotation, Advantages, Mueller Resonance Compaction, Dynamic Compaction, Depth of Improvement

#### **MODULE 3: Dewatering Methods**

Methods of Dewatering Systems, Design Steps for Dewatering Systems, Distance of Well Points from Sources of Seepage, Effective Well Radius, Discharge Computations, Design of Filters

#### **MODULE 4: Precompression and Vertical Drains**

Review of Compressibility of Soils and Consolidation, Principle of Precompression, Methods of Preloading, Monitoring of Compression, General Principle of Vertical Drains, Design of Vertical Drains, Types and Construction of Vertical Drains

#### **MODULE 5: Stone Columns**

Stone Columns, Improvement in Soil Bearing Capacity due to Stone Columns

#### **MODULE 6: Grouting and Injection**

Introduction, Groutability, suspension grout, solution grout, grouting equipments and methods, Applications

#### **MODULE 7: Cementing and Chemical Stabilization**

Cement Stabilization, Bituminous Stabilization, Chemical Stabilization

#### **MODULE 8: Introduction to Reinforcement of Soil**

Concept of soil reinforcement – Types of reinforcement material – Reinforced earth wall – Mechanism – simple design – applications of reinforced earth. Role of Geotextiles in filtration, drainage, separation, road works and containment.

#### **Textbooks/ Reference Books:**

1. Ground Improvement Techniques by Dr. P Purushothama Raj
2. Koerner, R.M. “Construction and Geotechnical Methods in Foundation Engineering”, McGraw Hill, 1994
3. Mittal.S, “An Introduction to Ground Improvement Engineering”, Medtech Publisher, 2013
4. Bergado et. al. – Soft Ground Improvement
5. Gopal Ranjan and A. S. R. Rao – Basic and Applied Soil Mechanics

#### **Recommended IS Codes:**

1. IS9759: 1981 “Guidelines for Dewatering During Construction”, Bureau of Indian Standards, New Delhi, Reaffirmed 1999
2. IS15284(Part1): 2003 “Design and Construction for Ground Improvement – Guidelines” (Stone Column), Bureau of Indian Standards, New Delhi, 2003

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817PE21	Earthquake Engineering	3-0-0	3

### **MODULE 1: Introduction to Seismology**

Understanding Earthquakes, Earth's Interior and Plate Tectonics, Causes of Earthquakes and Seismic Waves; Measurement of Earthquakes and Measurement parameters; Modification of Earthquake due to Local soil effect; Amplification

### **MODULE 2: Structural Systems for Seismic Resistance**

Structural systems – Building configuration, influence of structural classification on building responses - Basic Principles of seismic design. Soft Storey and Weak Storey concept

### **MODULE 3: Introduction to Structural Dynamics**

Equations of Motion for SDOF and MDOF Systems; Un-damped Free Vibration of SDOF and MDOF Systems; Mode Shapes and Frequencies of MDOF System; Concept of Response Spectra, Rayleigh Damping Matrix; Eigen Solutions and Modal Analysis of Structures for seismic loads

### **MODULE 4: Method of Seismic Analysis**

IS: 1893-1984 /2002/ 2016 - Seismic Coefficient method and Modal analysis method - Applications to multi-storied building frames – water tanks – chimneys. Concept of Equivalent Lateral Force for Earthquake; Response Spectrum Analysis, Modal Combination Rules; Response Spectrum Method of Analysis of Structures and Codal Provisions

### **MODULE 5: Earthquake Geotechnical Engineering**

Fundamentals of Seismic Soil-Structure Interaction; Local Site effects, Soil-structure interaction, Dynamics Properties of Soil, Dynamic Earth Pressure, Introduction to Soil Liquefaction and Liquefaction potential analysis method, Introduction to Ground Improvement Techniques

### **MODULE 6: Earthquake Resistant Construction**

Earthquake Resistant Design Philosophy; Concept of ductility in structures; ductile detailing requirements; Codal Provisions for ductile detailing (specific reference to IS: 13920-2016). Specific reference to IS: 4326 for Earthquake resistant construction of buildings.

Introduction to Earthquake-resistant features in non-engineered constructions and masonry structures; Introduction to IS: 13927 and IS: 13928-1993 through Assignment, Introduction to Retrofitting, various Retrofitting options for Buildings, Base isolation concept, Isolation systems

### **Textbooks/ Reference Books:**

1. I.S. 1893 - 2002 / 2016 - Criteria for Earthquake Resistance design of Structures
2. I.S. 1893 - 1984 - Criteria for Earthquake Resistance design of Structures
3. A.K. Chopra- 'Dynamics of Structures' Prentice Hall India
4. Pankaj Agarwal and Manish Shrikhande - 'Earthquake Resistant Design of Structures', PHI, 2008
5. Clough R.W. and Penzien J.- 'Dynamics of Structures', McGraw-Hill, Newmark N.M. and Rosenblueth E. - 'Fundamentals of Earthquake Engg.', Prentice Hall, 1971
6. David Key, 'Earthquake Design Practice for Buildings', Thomas Telford, London, 1988
7. Ellis L. Krinitzsky, J.M. Gould and Peter H. Edinger, 'Fundamentals of Earthquake Resistant Construction', John Wiley, 1993
8. S. L. Kramer, 'Geotechnical Earthquake Engineering'
9. I.S. Codes 4326, 13920-2016, IS: 13927 and IS: 13928-1993

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817PE22	River Engineering	3-0-0	3

### **MODULE 1: Introduction**

River course- upper, middle and deltaic reaches; Himalayan and Peninsular rivers, principal river systems of India.

### **MODULE 2: Types of Rivers**

Perennial, flashy and virgin rivers, incised and boulder rivers, rivers in the flood plains, deltaic rivers, braided rivers, tidal rivers, aggrading and degrading types of rivers

### **MODULE 3: River Behavior**

Behavior of rivers in straight reaches and bends; river meandering- causes and general features, factors affecting meandering, meandering parameters; cut-off, development and effects of cut-off, causes of braiding and delta formation

### **MODULE 4: Flood Estimation**

Rational, empirical and unit hydrograph methods; flood frequency analysis, probability and return period flood, Gumbel and Log Pearson distributions, design flood and probable maximum flood

### **MODULE 5: Origin and Formation of Sediments**

Nature of sediment problems; stream erosion and deposition, wind erosion and deposition, wind erosion and deposition

### **MODULE 6: Sediment Transport**

Sediment- bed load, suspended load and wash load; incipient motion of sediments, mode of sediment transport- rolling, sliding, saltation and suspension; introduction to theories of sediment transport including Shield's theory

### **MODULE 7: Regimes of Flow**

Definition, description of regimes of flow, plane bed, ripples, dunes, transition and anti-dune regime; prediction of regimes of flow

### **MODULE 8: River Training**

Definition, objectives classification- high water, low water and mean water river training; types of river training works- marginal embankments, spurs, guide banks, porcupines, bank pitching and revetments, cut-off, pitched island, sills and bottom panelling, bandalling; river training works in Assam

### **Textbooks/Reference Books:**

1. Chang H.H., "Fluvial Processes in River Engineering", Publisher: John Wiley & Sons
2. Garde R. J. and Ranga Raju K.G., "Mechanics of Sediment Transport and Alluvial Stream", Publisher: Wiley Eastern Ltd., New Delhi
3. Subramanya S. K., "Engineering Hydrology", Publisher: McGraw Hill Companies
4. Das M.M. & Saikia M.D., "Hydrology", Publisher: Prentice Hall of India Pvt. Ltd



Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817PE23	Machine Foundation	3-0-0	3

### **MODULE 1: General Principles of Machine Foundation Design**

Type of machines and foundations, general requirements of machine foundation, soil and machine data required for design, permissible amplitude, design criteria, relevant IS codes.

### **MODULE2: Theory of Vibrations**

Vibration of elementary systems, vertical, sliding, torsional and rocking modes of vibrations, degrees of freedom, coupled motion, undamped and damped free vibrations, overdamped, under damped and critically damped system, logarithmic decrement, undamped and damped forced vibration, constant force and rotating mass oscillators, mass-spring-dashpot model, equation of motion, dynamic magnification factor, principle of vibration measuring instruments.

### **MODULE 3: Dynamic Properties Soils**

Elastic constants, stiffness and damping of soils and their determination, block vibration test, cyclic plate load test.

### **MODULE 4: Design of Reciprocating Machine Foundations**

Methods of analysis, linear elastic weightless spring method, elastic half-space method, design procedures for block and frame foundations, codal provisions.

### **MODULE 5: Vibration Isolation and Absorber**

Force and motion isolation, vibration isolation techniques, transmissibility ratio, mechanical isolation, foundation isolation, isolation by location, isolation by barriers, undamped dynamic vibration absorber.

### **Textbooks/ Reference Books:**

1. Swami Saran, "Soil Dynamics and Machine Foundations", Galgotia Publications Pvt. Ltd., New Delhi.
2. Shamsher Prakesh and Vijay Kumar Puri, "Foundations for Machines: Analysis and Design", A Wiley-Interscience Publication, John Wiley and Sons.
3. P. Srinivasulu and C. V. Vaidyanathan, "Hand Book of Machine Foundations", McGraw-Hill Education.
4. Steven L. Kramer, "Geotechnical Earthquake Engineering", Prentice Hall International Series, Pearson Education India
5. F. E. Richart, Jr., J. R. Hall, Jr. and R. D. Woods, "Vibrations of Soils and Foundations", Prentice-Hall International Series
6. IS 2974-1: "Code of Practice for Design and Construction of Machine Foundations", Part 1: Foundation for Reciprocating Type Machines, Bureau of Indian Standards

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817OE11	Optimization Techniques	3-0-0	3

### **MODULE 1: Introduction and Basic Concepts**

Historical Development; Engineering applications of Optimization; Art of Modeling Objective function; Constraints and Constraint surface; Formulation of design problems as mathematical programming problems

Classification of optimization problems

Optimization techniques – classical and advanced techniques

### **MODULE 2: Optimization using Calculus**

Stationary points; Functions of single and two variables; Global Optimum

Optimization of function of one variable and multiple variables;

Optimization of function of multiple variables subject to equality constraints; Hessian matrix formulation; Eigen values

### **MODULE 3: Linear Programming**

Standard form of linear programming (LP) problem; Canonical form of LP problem; Assumptions in LP Models; Elementary operations

Graphical method for two variable optimization problem; Examples

Motivation of simplex method, Simplex algorithm and construction of simplex tableau; Simplex criterion; Minimization versus maximization problems

Revised simplex method; Duality in LP; Primal-dual relations; Dual Simplex method; Sensitivity or post optimality analysis, **Linear Programming Applications.**

### **MODULE 4: Dynamic Programming**

Sequential optimization; Representation of multistage decision process; Types of multistage decision problems; Concept of sub optimization and the principle of optimality

Recursive equations – Forward and backward recursions; Computational procedure in dynamic programming (DP), **Dynamic Programming Applications.**

### **MODULE 5: Advanced Topics in Optimization**

Piecewise linear approximation of a nonlinear function

Multi objective optimization

Direct and indirect search methods, GA

Evolutionary algorithms for optimization and search

Applications in civil engineering

**Textbooks/Reference Books:**

1. S.S. Rao, "Engineering Optimization: Theory and Practice", New Age International P)Ltd., New Delhi, 2000.
2. G. Hadley, "Linear programming", Narosa Publishing House, New Delhi, 1990.
3. H.A. Taha, "Operations Research: An Introduction", 5th Edition, Macmillan, New York, 1992.
4. K. Deb, "Optimization for Engineering Design-Algorithms and Examples", Prentice-Hall of India Pvt. Ltd., New Delhi, 1995.
5. K. Srinivasa Raju and D. Nagesh Kumar, "Multicriterion Analysis in Engineering and Management", PHI Learning Pvt. Ltd., New Delhi, India, ISBN 978-81-203-3976-7, pp.288, 2010.

Course Code	Course Title	Hours per week L-T-P	Credit C
CE1817OE12	Environmental Impact Assessment	3-0-0	3

### **MODULE 1: Introduction for EIA**

Framework, screening, scoping and baseline studies; techniques for assessment of impacts on physical resources, ecological resources, human use values and quality of life values. Impact assessment methodologies-various methods, their applicability. Strategic environmental assessment. Cumulative impact assessment. Risk and uncertainty in EIA.

### **MODULE 2: Environment Attributes**

Prediction and Methods of Assessment of Impacts on Various Aspects of Environment; Application of various models for the Prediction of impact on Air Environment, Water Environment, Noise Environment and Land Environment. Public participation in environmental decision making process

### **MODULE 3: Environmental Protection acts, Rules and Standards**

EIA guidelines, Environmental Policies-National and international; international treaties. Carbon management, Kyoto Protocol and Clean Development Mechanism (CDM), Carbon neutrality. Environmental Legislations-acts, rules, regulations and notifications. Environmental standards.

### **MODULE 4: Environmental Audit**

Objectives, types, features, planning of audits; organization of auditing programme, pre-visit data collection. Audit protocol; onsite audit; data sampling - inspections - evaluation and presentation, audit report - action plan - management of audits; waste management contractor audits. Introduction to ISO 14001 series, OHSAS 18001; case studies

### **MODULE 5: Environmental Management**

Preventive policy of environment, waste minimization, conservation of water and energy, use of renewable, sources, pollution audit, pollution control strategy, disposal of treated effluents, solid waste disposal concept of green cities, green belt development.

### **MODULE 6: Case Studies**

Environmental Impact Analysis on --- Hydroelectric power projects, Mining Projects, Nuclear Power Plants.

### **Textbooks/Reference Books:**

1. MoEF, GoI, Environment Impact Assessment, Impact Assessment Division, January 2001 (Manual)
2. Water (Prevention and Control of Pollution) Act 1974. Air (Prevention and Control of Pollution) Act 1981
3. Environmental Impact Assessment (2nd Ed.) -LW Canter, McGraw Hill Inc. Singapore, 1996
4. Environmental Impact Assessment-Cutting edge for the 21st century - A Gilpin, CUP, London, 1994
5. Environmental Impact Assessment-Theory & Practice - P Wathern, and U Hynman, Sydeny, 1988
6. Renewable Energy Environment and Development- M Dayal, Konark Pub. Pvt. Ltd., 1998

7. Planning and Implementation of ISO14001, Environmental Management System- G Gyani and A Lunia, Raj Publishiong House, Jaipur, 2000. 7. ISO 14001
8. An Introduction to Environmental Audit - RD Tripathi, Alpha Publications, 2009.
9. “The ISO: 14000 Handbook” – J Caseio (Ed), Published - CEEM Information Services. 2000
10. A Guide to the Implementation of the ISO: 14000 Series on Environmental Management - I Ritchie, and W Hayes, Prentice Hall, New Jersey, 1998. 11. OHSAS & SA Guidelines

Course Code	Course Title	Hours per week L-T-P	Credit C
HS181704	Principles of Management	3-0-0	3

**MODULE 1: Introduction** (6 Lecture)

Definition and meaning of management, Characteristics of management, importance of management, functions of management-planning, organising, directing, staffing, coordination and controlling etc., principles of management, Difference between administration and management

**MODULE 2: Financial Management** (6 Lecture)

Definition and management of financial planning, importance and characteristics of sound financial plan, concepts of capital- fixed capital and working capital, source of finance, fund flow statement.

**MODULE 3: Marginal Costing** (6 Lecture)

Definition and meaning of marginal costing, advantages, marginal cost equation, contribution, profit-volume ratio, break even analysis, margin of safety.

**MODULE 4: Cost Accounting** (6 Lecture)

Cost Accounting- Concept and benefit, elements of cost, preparation of cost sheet with adjustment of raw materials, work-in-progress and finished goods.

**MODULE 5: Capitalisation**

Definition and meaning of capitalisation, over and under capitalisation.

**MODULE 6: Motivation** (6 Lecture)

Introductory observation, definition of motivation, motivational technique, features of sound motivational system.

**MODULE 7: Leadership** (6 Lecture)

Concept of leadership, principles of leadership, functions of leadership, qualities of leadership, different styles of leadership

**Textbooks/Reference Books:**

1. Principle of Business Management: RK Sharma, Shashi K.Gupta
2. Business Organisation and Management: SS Sarkar, RK Sharma, Shashi K.Gupta
3. Industrial Organisation and Management: SK Basu, KC Sahu, B Rajvive
4. Principles of Management by Dr. A. K. Bora: Chandra Prakash, Guwahati.
5. Management Accounting: RK Sharma, Shashi K Gupta
6. Cost Accounting: SP Jain, K I Narang
7. Cost Accounting, RSN Pillai, V Bhagawati
8. Principles of Management: RN Gupta
9. Principles of Management: RSN Pillai, S. Kala
10. Principles of Management: Dipak Kumar Bhattacharjee

<b>Course Code</b>	<b>Course Title</b>	<b>Hours per week L-T-P</b>	<b>Credit C</b>
<b>CE181722</b>	<b>Project-1</b>	<b>0-0-6</b>	<b>3</b>
<b>GUIDELINES WILL BE ISSUED BY THE UNIVERSITY FROM TIME TO TIME</b>			

<b>Course Code</b>	<b>Course Title</b>	<b>Hours per week L-T-P</b>	<b>Credit C</b>
<b>SI181721</b>	<b>Internship-III (SAI - Industry)</b>	<b>0-0-0</b>	<b>2</b>
<b>GUIDELINES WILL BE ISSUED BY THE UNIVERSITY FROM TIME TO TIME</b>			

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